

REMARKS

The Official Action dated December 28, 2005 has been received and its contents carefully noted. In view thereof, the specification as well as claims 1-18 have been amended in order to better define that which Applicants regard as the invention. As previously, claims 1-18 are presently pending in the instant application.

Initially, with reference to page 2 of the Office Action, the drawings have been objected to as failing to comply with 37 C.F.R. §1.84(p)(5) because they include reference characters not mentioned in the description. As can be seen from the foregoing amendments, reference characters 16 referred to in Fig. 1, and 213 and 214 referred to in Fig. 2 have been included on pages 7 and 9 of Applicants' specification respectively. With respect to reference numeral 210 set forth in Fig. 2, it is noted that this reference numeral and particularly the memory management unit 210 is referred to on page 9, line 26, of Applicants' specification. Accordingly, in view of the foregoing it is respectfully submitted that Applicants' drawings and specification are now in proper formal condition for allowance.

With reference to paragraph 2 of the Office Action, claims 9 and 17 have been objected to as including minor informalities. As can be seen from the foregoing amendments, those informalities noted by the Examiner have been cured and consequently, it is respectfully submitted that Applicants' claimed invention as set forth in each of claims 9 and 17 is now in proper formal condition for allowance.

With reference now to page 3 of the Office Action, claims 1-8 have been rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner notes several instances where sufficient antecedent basis for limitations set forth in claims 1 and 6 is not provided. As can be seen from the foregoing amendments, each of

claims 1 and 6 have been amended in order to provide proper antecedent basis for the several limitations set forth therein. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in claims 1-8 is now in proper formal condition for allowance.

With reference to paragraphs 9-24 of the Office Action, claims 1-5, 7-12 and 14-18 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,525,726 issued to Xie et al. This rejection is respectfully traversed in that the patent to Xie et al. neither discloses nor suggests that which is presently set forth by Applicants' claimed invention.

As can be seen from the foregoing amendments, independent claim 1 recites a method for testing visibility of graphics primitives said method comprising the steps of computing the geometry of graphics primitives, testing the visibility of the computed primitives in a first visibility test, storing occlusion data of the visible primitives for a next comparison based on said first visibility test, computing the occlusion data for each visible primitive, collecting the primitives to an inclusion data buffer, testing the visibility of the collected primitives in a second visibility test with said computed occlusion data and rasterising visibility primitives of the second visibility test. With respect to independent claim 9, this claim recites a system for testing visibility on graphics primitives with the system comprising a geometry processor, a Z-buffer component, a first visibility test module, an occlusion fusion unit, a pixel processing means, an occlusion data buffer and a second visibility test module.

In accordance with Applicants' claimed method, two visibility tests are carried out. When a triangle arises from the geometry processing stage, its visibility is initially tested at the first visibility test. For the visible triangles, occlusion data is computed and updated into a buffer and particularly to a low resolution Z-buffer. Subsequently, the triangles are routed through and occlusion data buffer. Once they emerge from the occlusion data buffer,

occlusion data has already been computed and updated using a potentially large number of other triangles that were submitted after the current triangle. As a result, the two seemingly similar tests operate using different data (same buffer, at different times) and are therefore not to be confused with or considered as two subtests.

With respect to the teachings of Xie et al., this reference describes a two pass rendering method, wherein the method first stores all triangles/polygons of a frame into an intermediate data structure. In the second pass, the data structure is purged one tile at a time (rectangle on the screen) so that the triangles nearest the camera are rendered first. All of the visibility tests set forth in Xie et al. are performed in the second pass, and are basically parts of the same test. Consequently, it is respectfully submitted that there is actually only one test being performed, which is decomposed into subtests, of which the first one is extremely fast but inaccurate (rejecting all triangles in more distant buckets), the second one being more involved and more accurate (HZ test), and finally a third subtest (traditional Z-buffer) is the slowest but most accurate of the tests set forth in Xie et al. It is to be noted that the method set forth by Xie et al. in conducting multiple subtests does not reduce the number of pixels that need to be shaded, textured, etc. Exactly the same pixels would be processed if only the traditional Z-buffer were used. As noted above, in accordance with the claimed invention two seemingly similar tests operate using different data and therefore cannot be considered as two subtests as is the case with Xie et al. And furthermore, in accordance with the present invention, the method executes in a single pass because the "occlusion data buffer" can contain any number of triangles, whereas Xie et al. must capture all triangles of a frame before proceeding with the actual rendering. Consequently, the number of pixels that ultimately need to be shaded, textured, etc. is significantly reduced by the two test method set forth in accordance with Applicants' claimed invention which is significantly different from

the method set forth in Xie et al. Further, given the method performed by Xie et al., this reference would not include all of the components of Applicants' claimed system set forth in claim 9. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in claims 1-5, 7-12 and 14-18 clearly distinguish over the teachings of Xie et al. and are in proper condition for allowance.

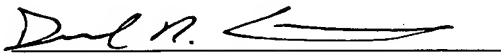
With reference now to paragraphs 26-29, claims 6 and 13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Xie et al. in view of U.S. Patent No. 6,720,964 issued to Fowler et al. This rejection is respectfully traversed in that the patent to Fowler et al. does nothing to overcome the aforementioned shortcomings associated with the teachings of Xie et al.

Specifically, while Fowler et al. may disclose a system which includes means for compressing and decompressing the occlusion data buffer, this reference clearly fails to overcome the aforementioned shortcomings associated with the system of Xie et al. as discussed in detail hereinabove. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in each of dependent claims 6 and 13 clearly distinguish over the combination proposed by the Examiner and are in proper condition for allowance.

Therefore, in view of the foregoing it is respectfully requested that the objections and rejections of record be reconsidered and withdrawn by the Examiner, that claims 1-18 be allowed and that the application be passed to issue.

Should the Examiner believe a conference would be of benefit in expediting the prosecution of the instant application, he is hereby invited to telephone counsel to arrange such a conference.

Respectfully submitted,


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